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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/753,397	01/03/2001	Yushi Jinno	2933SE-62-DIV	2805

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EXAMINER

ECKERT II, GEORGE C

ART UNIT	PAPER NUMBER
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2815

DATE MAILED: 09/23/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/753,397

Applicant(s)

JINNO ET AL.

Examiner

George C. Eckert II

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 June 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) 1-6 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 7-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 January 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 08/997,763.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

Applicant's amendment dated June 18, 2002 in which claims 7-9 were amended has been entered of record.

Election/Restrictions

Claims 1-6 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a non-elected invention, there being no allowable generic or linking claim.

Election was made **without** traverse in Paper No. 8.

Priority

Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copy has been filed in parent Application No. 08/997,763, filed on December 24, 1997.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 9 is again rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 9 cites that the grain size of the channel is chosen based on a desired on current of the transistor. This claim language does not make clear the metes and bounds of

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applicant's invention. That is, the variable of "grain size" is still to be chosen based on an unknown variable of "desired on current." As such, it is still not clear what grain size will suffice for this claim.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 7-10 are rejected under 35 U.S.C. 102(b) as being anticipated by US 5,548,132 to Batra et al. With regard to claims 7 and 8, Batra et al. teach, with reference to figures 4-7 and the text beginning in column 5, line 62, a bottom gate thin film transistor 50 comprising: an insulator substrate 52, a gate electrode 54 located on the insulator substrate, an insulator film 56/58 provided on the substrate and gate electrode, and an active layer 60 including a polycrystalline silicon film on the insulator film where a drain 70, a source 72 and a channel 62 over the gate electrode are defined, wherein grain sizes of the drain and source are greater than a grain size of the channel (see the description of the first embodiment of Batra (col. 2, lines 1-34), as used in the previous Office action, which teaches that the source/drain regions alone are made amorphous and annealed such that their grain size is larger than that of the channel. Note also that while Batra shows in figs. 4-7 only the drain offset 66 having a larger grain size, it is taught in column 6, lines 8-10 that the channel region alone may be masked such that the entire source and drain regions have the larger grain size, not merely the offset region).

With regard to claims 9 and 10 (claim 9 as best understood), Batra et al. teach that the grain size of the channel is $0.1\text{ }\mu\text{m}$ ($1000\text{ }\text{\AA}$) which will provide desired device characteristics such as on current. Alternatively, the limitation of claim 9 is merely an intended use or processing limitation, neither of which further limit the structure of claim 8.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Batra et al. Batra et al. taught the device of claims 8 and 9 but did not expressly teach that the grain size of the channel were in a range of $1500 - 20,000\text{ }\text{\AA}$ or $3000 - 10,000\text{ }\text{\AA}$. Because Batra et al. did teach that the grain size of the channel was approximately $1000\text{ }\text{\AA}$, it is considered obvious that one of skill in the art would form the channel region having grain sizes in the range of $3000 - 10,000\text{ }\text{\AA}$. The motivation for doing so, as is taught by Batra et al., is that larger grains will have fewer grain boundaries and thus fewer dangling Si bonds which trap carriers (col. 2, lines 39–41). As such, it is considered obvious to obtain the device of instant claims 11 and 12.

Response to Arguments

Applicant's arguments filed June 18, 2002 have been fully considered but they are not persuasive. Applicant argues that Batra is directed towards a bottom gate TFT having *only* a

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drain offset region with larger grain size than the channel and thus Batra cannot anticipate the claim which cites that *both* the source and drain regions have a larger grain size than the channel. However, the examiner cannot agree as this simply ignores the explicit teaching of Batra. Specifically, though figures 4-7 of Batra show an embodiment in which only the offset region has a larger grain size than the channel, Batra makes very clear that the fabrication process may be altered such that only the channel region is masked during the amorphous/re-annealing process (col. 6, lines 8-10, see also the above rejection of claims 7 and 8). As such, Batra does expressly teach a bottom gate device in which the source and drain, and not merely the offset region, have a larger crystal grain size than does the channel region.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.


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Any inquiry concerning this communication or earlier communications from the examiner should be directed to George C. Eckert II whose telephone number is (703) 305-2752.

The examiner can normally be reached on 8:00 - 5:30, alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Lee can be reached on (703) 308-1690. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.


GEORGE ECKERT
PRIMARY EXAMINER

GCE
September 20, 2002